

A REVISION OF CONNECTANT FORMS BETWEEN
CÆNOSIAN AND LIMNOPHORINE GENERA
OCCURRING IN NORTH AMERICA
(DIPTERA, MUSCIDÆ)

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The present paper deals with those few genera that seemingly form a buffer group between the more typical cænosian and limnophorine segregates as they are represented in North America. Such a concept includes the genera *Atherigona* Rondani, *Limnospila* Schnabl, *Pseudocoenosia* Strobl, *Phyllogaster* Stein, and *Macrorehis* Rondani. Karl (7)* has assembled this group under the tribe Chelisiini (subfamily Cænosiinæ), but that tribal name for this group is, in my opinion, invalidated by the fact that the genus *Chelisia* does not belong to this subfamily.

The above genera may be linked together by the possession of the following characters: The presence of one pair of reclinate parafrenal bristles adjacent the ocellar callosity; the arrangement of the sterno-pleural bristles in the form of an equilateral triangle; the presence of two pairs of presutural dorsocentral bristles; the vein $Cu_2 + 1st A.$ is traceable to beyond half-way to margin of wing; the absence of cruciate bristles on frontal vitta; the well marked development of the lower calyptal scale beyond the confines of the upper.

The European genus *Dexiopsis* Pokorny (23), although belonging to this group, has been incorrectly recorded by Stein (41), Aldrich (1), Williston (44), and others, as occurring in North America. Stein's inclusion of the genus was founded on his description of *Dexiopsis basalis* (33), a species which Malloch (12) correctly recognized as not being congeneric, and which he later made the type of the new genus *Neodexiopsis* (13). Aldrich (1) included North American records of *Anthomyza lacteipennis* Zetterstedt under *Dexiopsis*, but Johannsen (6) has pointed out that this species is none other than *Lispocephala*

* Numbers in brackets refer to literature cited.

erythroceræ (Robineau-Desvoidy), and should not be confused with *Aricia lacteipennis* Zetterstedt, a true *Dexiopsis*.

KEY TO GENERA

1. Fore femur with a complete series of posteroventral bristles, from base to apex; eyes hemispherical in outline, narrower ventrad than at middle; mesonotum with at least one pair of presutural dorsocentral bristles as well developed as the posterior notopleural bristle; costal cell normal in size, not enlarged by the convexity of costa, subcosta uniting with costa at a point proximad of that opposite *r-m* cross vein 2
- Fore femur with only one or two bristles on posteroventral surface, distad; eyes oblong in outline, width at lower third as great as that at middle; mesonotum with presutural dorsocentral bristles weakly developed, shorter than posterior notopleural bristle; costal cell abnormal in size, the costa bounding the cell slightly convex, and subcosta uniting with costa at a point opposite *r-m* cross vein *Atherigona* Rondani
2. Arista with a longish thickening throughout proximal third; second antennal segment markedly depressed proximad on dorsum adjacent the stigma, as if the segment were pinched basad *Phyllogaster* Stein
- Arista thickened only at base; second antennal segment normal in appearance, with no depressed area proximad 3
3. Ocellar triangle short, not extending cephalad to base of antennæ, and not densely whitish pruinose, when viewed from in front; distance between bases of inner pair of vertical bristles much shorter than the length of either bristle; hind femur with well developed bristles on proximal half of anteroventral surface; hypopygium in male conspicuous; large species, 5 mm. + 4
- Ocellar triangle extending to base of antennæ, with dense whitish pruinescence; distance between bases of inner pair of vertical bristles about as great as length of either bristle; hind femur with no well developed bristles on proximal half of anteroventral surface; small species, 4 mm.
Limnospila Schnabl
4. Frontal vitta at middle scarcely wider than twice breadth of either parafrontal; caudal pair of ocellar bristles weakly developed, not longer than presutural acrostical bristles, directed forward; lower stigmatal bristle directed upward; prosternum shining, polished.
Pseudocoenosia Strobl
- Frontal vitta at middle much wider than twice breadth of either parafrontal; caudal pair of ocellar bristles well developed, longer than presutural acrostical bristles, directed outwards; lower stigmatal bristle directed downward; prosternum grayish pruinose.
Macrorchis Rondani

Genus *Atherigona* Rondani

Atherigona Rondani, Dipt. Ital. Prodr., 1856 I p. 97. . . .
Schiner, Faun. Austr., 1862 I p. 669. . . . Rondani, Atti

Soc. Ital. Scienz. Natur., 1866 IX p. 76. . . . Rondani, Dipt. Ital., Prodr., 1877 VI (5) pp. 15, 250. . . . Meade, Ann. Mag. Nat. Hist., 1883 XX pp. 59, 107. . . . Meade, Descr. List Brit. Anth., 1897 II p. 76. . . . Pandellé, Rev. ent. France, 1899 XVIII p. 161. . . . Stein, Termesz. Fürzetek., 1900 XXIII pp. 154-159. . . . Schnabl, Wien. Ent. Zeitg., 1902 XXI (8-9) pp. 199-202. . . . Stein, Mittheil. Zool. Mus. Berlin, 1903 II p. 110. . . . Stein, Katal. Paläark. Dipt., 1907 III p. 676. . . . Schnabl and Dzeidzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., 1911 XCV (2) pp. 181-183. . . . Stein, Ann. Mus. Nat. Hungar., 1913, XI pp. 529-541. . . . Stein, Arch. f. Naturgesch., 1914 (1913) A (8) p. 11. . . . Stein, Arch. f. Naturgesch., 1916 (1915) A (10) pp. 117, 220. . . . Stein, Arch. f. Naturgesch., 1919 (1917) A (1) p. 145. . . . Aldrich, Ins. Inse. Menstr., 1921 IX (4-6) pp. 93-98. . . . Malloch, Ent. News, 1921 XXXII p. 106. . . . Malloch, Ann. Mag. Nat. Hist., 1922 ser. 9 X p. 575. . . . Séguy, Faune de France, 1923 (6) p. 249. . . . Malloch, Ann. Mag. Nat. Hist., 1924 ser. 9 XIII pp. 410-413; XIV p. 518. . . . Malloch, Proc. Linn. Soc. N. S. Wales, 1924 XLIX Pt. 2 p. 145; 1925 L Pt. 2 p. 44. . . . Malloch, Mem. Dept. Agr. Ind., Ent. Series, 1925 VIII No. 11 pp. 111-122. . . . Ramachandra Rao, Mem. Dept. Agr. Ind. Ent. Series, 1925 VIII No. 11 pp. 123-125. . . . Malloch, Ent. Mittheil., 1928 XVII (4) pp. 297-303; (5) pp. 310-313. . . . Karl, Tierwelt Deutschlands, 1928 XIII (3) p. 209. . . . Malloch, Insects of Samoa, 1929 Part VI Fasc. 3 pp. 157-159. . . . Curran, Fam. Gen. N. A. Dipt., 1934 p. 396.

Acritochæta Grimshaw, Fauna Hawaiiensis, 1902 II p. 41. . . . Stein, Arch. f. Naturgesch., 1911 A (1) p. 145.

Genotype *Cænosiæ varia* Meigen

The genus *Atherigona* was erected by Rondani (26) in 1856, with *Cænosiæ varia* Meigen as type. In 1862 Schiner (28), in redescribing the genus, cited *varia* as a synonym of *Musca quadripunctata* Rossi. The genus has been accepted generally by authors as valid, although no such unanimity of opinion has

been expressed regarding its generic relationships. This problem has no doubt been rendered difficult owing to the aberrant appearance of the species. Schnabl (30) in 1902, and again (31) in 1911, after listing the motley collection of characters belonging to the genus, concluded that it might be regarded as an intermediate form between the muscoid group of genera and the tachinid genus *Siphona* Meigen. Stein (35) (38) (39) (41), in most of his more important contributions placed the genus near the limnophorine genera as opposed to those allied to *Cænosi*a, c.f., *Macrorchis*, *Dexiopsis*. In this he was followed by Séguy (32). Malloch (14) (15) at first placed the genus among others belonging to the subfamily *Cænosiinæ*, but later (18) (19) came to regard its position as more closely in keeping with the *Phaoninæ* (11). Recently Malloch (21) has restored the genus to the *Cænosiinæ*, basing his action on the fact that the species possess only one pair of reclinate parafrontal bristles at vertex of head. Karl (7) in recording the German fauna included the genus among eight comprising his tribe *Chelisiini* of the subfamily *Cænosiinæ*, a group to which I believe it most naturally belongs though not under that name.

In 1902 Grimshaw (5) described the genus *Acritochæta*, with sole species *A. pulvinata* new. This group represents those species of the genus *Atherigona* in which many of the males have a shallow dorsal impression along the distal region of fore femur, and in which the male genitalia lack the trifoliate process borne at tip of a slender stalk, characters which serve to distinguish the segregate from that of *varia* and associated species. Stein (36) at first regarded the group as entitled to generic rank, but later (37) reduced it to subgenus. Malloch (17), on account of the secondary sexual nature of the characters, refrained from recognising the group. Ramachandra Rao (24) in studying the habits of some of the Indian species of *Atherigona* found that they could be satisfactorily placed into two distinct groups according to their larval habits, supporting thereby the proposed division of the genus into two groups on the basis of the presence or absence of certain male characters in the adult.

I have used the genus *Atherigona* in its traditional sense, believing that, in the light of present knowledge, the segregate *Acri-*

tochæta may be accepted as of subgeneric significance. The species described by Grimshaw as *Acritochæta pulvinata* is, in my opinion, none other than *Atherigona orientalis* Schiner, which species had been previously recorded by Malloch (14) as occurring in Florida under the name *A. varia* Meigen.

Diagnostic characters: Costal cell enlarged by the slight convexity of costa and by the termination of subcosta in costa at a point nearly opposite the *r-m* cross vein; presutural dorsocentral bristles inconspicuous, shorter than posterior notopleural bristle; dorsal bristle of mesopleural series setulose in character; eyes oblong in outline, width on lower third equal to that at middle; fore femur with posteroventral bristles restricted to distal third of surface.

Atherigona (Acritochæta) orientalis Schiner

?*Atomogaster triseriata* Walker, Proc. Linn. Soc. London, 1861 VI p. 11.

Atherigona orientalis Schiner, Reise oesterreich. Fregatte Novara, Dipt., 1868 p. 295. . . . Stein, Annal. Mus. Civico Storia Natural. Genova, 1900 ser. 2 XX (40) p. 22.

Cænoscia excisa Thomson, Kongl. Svensk. Fregatten Eugénies Resa, Dipt., 1868 p. 560.

Atherigona trilineata Stein, Term. Füz., 1900 XXIII p. 157. . . . Stein, Tijdschr. v. Ent., 1909 LII p. 253.

Acritochæta pulvinata Grimshaw, Fauna Hawaiiensis, 1902 II p. 41.

Atherigona magnipalpis Stein, Berl. Ent. Zeitschr., 1906 LI p. 66.

Atherigona (Acritochæta) excisa Stein, Wien. Ent. Zeitg., 1910 XXIX (2-3) p. 76. . . . Stein, Ann. Mus. Nat. Hungar., 1918 XVI pp. 158, 177.

Acritochæta trilineata Stein, Arch. f. Naturgesch., 1911 A (1) p. 145.

Acritochæta excisa Stein, Suppl. Entomol., 1915 No. 4 p. 42.

Atherigona excisa Stein, Arch. f. Naturgesch., 1919 (1917) A (1) p. 145. . . . Malloch, Ann. Mag. Nat. Hist., 1923 ser. 9 XII p. 185; 1924 ser. 9 XIII p. 413. . . . Malloch, Mem. Dept. Agr. Ind., Ent. Series, 1925 VIII (11) p. 115. . . . Ramachandra Rao, Mem. Dept. Agr. Ind., Ent. Series, 1925

VIII (11) p. 124. . . . Illingworth, Proc. Haw. Ent. Soc., 1927 VI p. 395.

Atherigona pulvinata Aldrich, Ins. Inscit. Menstr., 1921 IX (4-6) p. 96.

Atherigona varia Malloch not Meigen, Ent. News, 1921 XXXII p. 107.

In naming the species *orientalis* Schiner and not *excisa* Thomson I do so without having succeeded in obtaining authentic information relative to the dates of issue of the two works concerned. Verrall in reviewing Thomson's work in the Zoological Record for 1869 stated that he feared that many of the species were synonyms owing to the appearance of Schiner's work in the same year. Brauer, according to Osten Sacken (22), contended that Thomson's volume was not actually issued until 1869, a contention, it is thought, which might have been motivated by the desire of securing the priority of Schiner's names. Stein (41) in his catalogue of the anthomyian genera of the world gave *excisa* priority over *orientalis*, as have most authors. I have accepted Verrall's statement as indicative of the fact that Schiner's work was the first to be issued, hence the prior claims of *Atherigona orientalis* as the name for the species. I have cited the synonymy revealed by Stein (40) (41) and Malloch (16).

The species is the only one of the genus recorded as occurring in North America, being confined to those parts of the southern States where tropical and subtropical conditions exist. In fact although associated with other species of the genus in other parts of the world, it is so far the only species recorded from neotropical regions. Its interspecific relationships have been fully dealt with by Malloch (17) (20). Florida, 2 ♂, 2 ♀, Dunedin, Jan. 30, 1932 (A. L. Melander).

Genus Phyllogaster Stein

Tetrachæta Stein not Ehrenberg, Berl. Ent. Zeitschr., 1898 (1897) XLII (3-4) p. 254. . . . Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 559. . . . Williston, Manual N. A. Dipt., 1908 3rd ed. p. 336.

Phyllogaster Stein, Berl. Ent. Zeitschr., 1898 (1897) XLII

(3-4) p. 256. . . . Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 559. . . . Williston, Manual N. A. Dipt., 1908 3rd ed. p. 336. . . . Coquillett, Proc. U. S. Nat. Mus., 1910 XXXVII (1719) p. 590. . . . Malloch, Canad. Ent., 1917 XLIX p. 227. . . . Malloch, Bull. Brooklyn Ent. Soc., 1917 XII (2) p. 36. . . . Stein, Arch. f. Naturgesch., 1919 (1917) A (1) pp. 95, 141. . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9) pp. 58, 59. . . . Malloch, Canad. Ent., 1921 LIII p. 11. . . . Hockett, Mem. 101 N. Y. (Cornell) Agr. Exp. Station, 1928 (1926) p. 835. . . . Curran, Fam. Gen. N. A. Dipt., 1934 p. 399.

Tetramerinx Berg, Comm. Mus. Nac. Buenos Aires, 1898 I p. 17. . . . Coquillett, Proc. U. S. Nat. Mus., 1910 XXXVII (1719) p. 613. . . . Stein, Arch. f. Naturgesch., 1911 A (1) p. 144. . . . Bezzi, Wien, Ent. Zeitg., 1907 XXVI (2) p. 54. . . . Bezzi, Zeitschr. f. Hymen. u. Dipt., 1908 VI p. 50. . . . Malloch, Canad. Ent., 1917 XLIX pp. 225, 226. . . . Malloch, Bull. Brooklyn Ent. Soc., 1917 (XII) (2) p. 36. Malloch, Trans. Amer. Ent. Soc., 1918 No. 782 p. 273. . . . Stein, Arch. f. Naturgesch., 1919 (1917) A (1) pp. 95, 141. . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9) pp. 59, 60. . . . Malloch, Canad. Ent., 1921 LIII p. 11. . . . Hockett, Mem. 101 N. Y. (Cornell) Agr. Exp. Station, 1928 (1926) p. 834.

Parasteinia Cockerell, Canad. Ent., 1905 XXXVII p. 361.

Genotype *Phyllogaster cordyluroides* Stein

The genus *Phyllogaster* was described by Stein (33) in 1898 for the reception of one species, *P. cordyluroides* new. In 1910 Coquillett (4) designated Stein's species as the genotype. Four additional species have been included in the genus, all from North America.

The allied genus *Tetrachæta* was erected by Stein at the same time as *Phyllogaster* for the reception of the single species *T. unica* new. Its description has precedence over that of *Phyllogaster*, but because the name *Tetrachæta* has been found to be a homonym it thereby has forfeited its claims to priority, should such an occasion arise. In the same year Berg (2) called atten-

tion to the preoccupation of the name by Ehrenberg in 1844, and proposed the new name *Tetramerinx* for the genus. In 1905 Cockerell (3) inadvertently proposed another name, *Parasteinia*, citing the same reason as proposed by Berg for the change.

In 1910 Coquillett (4) designated *T. unica* as the genotype of *Tetramerinx*, and henceforth the treatment of the group has closely paralleled that of *Phyllogaster*. Three species have been assigned to the genus, all of which have been found to occur in North America.

The habitus of the species of the two genera *Phyllogaster* and *Tetramerinx* is apparently similar, the adults having been found in the vicinity of marshy ground and sand dunes along the coast line from Maine to Texas, at various places along the Pacific coast from Washington to lower California, and also in the vicinity of the beaches of some of the Great Lakes. I have made a careful study of the characters used in separating the genera, and find that few, if any, are of real worth. In fact there are present other characters common to the two groups which appear so strong that there seems to me little reason for maintaining the two segregates apart. These common distinctions are to be found in the peculiar dorsal depression at base of second antennal segment, as if the segment here had been flattened, in the lengthened thickening of the arista on proximal half, and in the relatively robust development of the caudal pair of ocellar bristles, which are directed outwards.

KEY TO SPECIES

1. Thorax with four pairs of postsutural dorsocentral bristles2
- Thorax with three pairs of postsutural dorsocentral bristles4
2. Hind tibia with apical posteroventral bristle stoutly developed; hind femur with well developed bristles continued to near base of anteroventral surface; cheeks as high as half height of eye; fore tibia with a mid anterodorsal bristle; female with no recurved spines on subanal plate of ovipositor*inermis* Stein
- Hind tibia with apical posteroventral bristle setulose, weakly developed; hind femur with well developed bristles restricted to distal half of anteroventral surface; cheeks not as high as half height of eye; fore tibia with no mid anterodorsal bristle; female with recurved spines on subanal plate of ovipositor3
3. Tibiæ blackish; abdomen with at most a dorsocentral streak, otherwise unmarked; mid tibia with an anterodorsal bristle; male with processes

- of fifth sternum sharply tapered apicad, polished at apex and along outer border *unicus* Stein
- Tibiæ reddish; abdomen with a dorsocentral vitta and a pair of spots on terga 3 and 4 respectively; mid tibia with no anterodorsal bristle; male with processes broadly rounded apicad, not polished *rufitibia* Stein
4. Hind tibia with apical posteroventral bristle stoutly developed5
- Hind tibia with apical posteroventral bristle weakly developed, setulose8
5. Fore tibia with a mid posteroventral bristle; mid tibia with a mid anterodorsal bristle; hind tibia with 3 bristles at apex of dorsum.
robustus Johnson
- Fore tibia with no mid posteroventral bristle; mid tibia with no mid anterodorsal bristle; hind tibia with 2 bristles at apex of dorsum.6
6. Arista with longest hairs as long as setulæ on first antennal segment; hind tibia with distal posterodorsal bristle much longer ($\times 1.5$) than proximal posterodorsal bristle *longispinus* Malloch
- Arista with longest hairs not as long as setulæ on first antennal segment; hind tibia with distal posterodorsal bristle not longer than proximal posterodorsal bristle7
7. Prebasal scutellar bristles shorter than caudal pair of dorsocentral bristles; pulvilli small, wider than long; female with recurved spines on ovipositor as stoutly developed as the abdominal macrochaetæ.
mallitosus new sp.
- Prebasal scutellar bristles as long as caudal pair of dorsocentral bristles; pulvilli elongate, well developed, longer than wide; female with recurved spines on ovipositor weaker in development than abdominal macrochaetæ *cordyluroides* Stein
8. Abdomen with dorsocentral vitta and paired spots on terga 3 and 4 respectively; hind tibia with 2 posterodorsal bristles; arista thickened on proximal half; proximal sector of R_{4+5} bare *parvimaclulatus* Stein
- Abdomen with no markings; hind tibia with 1 posterodorsal bristle; arista thickened on proximal two-fifths; proximal sector of R_{4+5} frequently with setulæ or traces of such *littoratis* Malloch

Phyllogaster inermis Stein

Phyllogaster inermis Stein, Arch. f. Naturgesch., 1920 (1918) A (9) p. 58.

The species has four pairs of postsutural dorsocentral bristles, as in the case of *unicus* and *rufitibia*, but from these species it may be distinguished by the possession of a stoutly developed apical posteroventral bristle on hind tibia, and by the presence of well developed bristles on proximal as well as on distal half of anteroventral surface of hind femur. The female evidently differs from all others known to me in the genus in lacking the recurrent spines on subanal plate of ovipositor.

California, 1 ♀, Stanford Univ., Oct. 190-. (U. S. N. M.)
 Washington, 1 ♂, Dewatto, Aug. 15 1910; 1 ♀, Friday Harbor,
 July 7 1905 (Z. M. U. B.).

Phyllogaster unicus (Stein)

Tetracheta unica Stein, Berl. Ent. Zeitschr., 1898 (1897) XLII
 (3-4) p. 254.

Tetraminx unica Aldrich, Misc. Smithsn. Inst., 1905 XLVI No.
 1444 p. 559. . . . Smith, Ann. Rept. N. J. State Mus., 1909,
 1910 p. 792. . . . Malloch, Canad. Ent. 1917 XLIX p. 226.
 . . . Stein, Arch. f. Naturgesch., 1919 (1917) A (1) p. 141.
 . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9) p. 60.
 . . . Malloch, Canad. Ent., 1921 LIII p. 11. . . . Johnson,
 Occ. Pap. Boston Soc. Nat. Hist., No. VII 1925 p. 230. . . .
 Hallock, Circ. 103 N. J. Dept. Agr. 1926 p. 17. . . . John-
 son, Insect Fauna, Biol. Surv. Mt. Desert Region, 1927 p.
 209. . . . Hockett, Mem. 101 N. Y. (Cornell) Agr. Exp.
 Station, 1928 (1926) p. 834.

The species is associated with *rufitibia* and *inermis* in that the thorax of all three species has four pairs of postsutural dorso-central bristles, but from the former species *unicus* may be distinguished by the blackish tibiae, the possession of an anterodorsal bristle on mid tibia, and by the lack of paired marks on abdomen; from *inermis*, by the lack of a stoutly developed apical posteroventral bristle on hind tibia, by the absence of bristles on proximal half of anteroventral surface of hind femur, and in the female by the presence of four recurved spines on subanal plate of ovipositor.

Alberta, 1 ♂, Lethbridge, Sept. 4 1926 (H. L. Seamans) (C. N. C.).

British Columbia, 1 ♀, Kalso, July 16. (U. S. N. M.).

California, 1 ♀, Fresno, Oct. 29 1922. (H. C. H.).

Colorado, 1 ♀, Grand Jet, June 14 1927 (U. S. N. M.).

Idaho, 2 ♂, Emmett, June 23, 1926, 2373 ft.; 1 ♀, Challis, July 7
 1926, 5280 ft.; 1 ♀, Homedale, June 18 1926, 2238 ft.; 1 ♀,
 Mt. Home, June 15 1926, 3138 ft. (Haegele) (Univ. Idaho).

Maryland, 3 ♂, 3 ♀, Chesapeake Beach, Aug. 19, 1919; 2 ♂, 4 ♀,
 May 1930; 10 ♂, 8 ♀, June 30 1926 (J. M. Aldrich) (U. S.
 N. M.).

- Massachusetts, 1 ♀, Woods Hole, (U. S. N. M.); 3 ♀, Woods Hole, Aug. 2 1900 (Z. M. U. B.).
- New Brunswick, 1 ♀, Shippigan, July 14 1931 (U. S. N. M.).
- New Jersey, 2 ♀, Ocean City, May 7; 1 ♀, Sea Isle City (U. S. N. M.).
- New York, 1 ♂, Montauk Point, Long Island, Sept. 4 1927; 2 ♀, Babylon, Long Island, July 26 1933; 1 ♀, June 20, 1932; 1 ♀, July 29 1933 (F. S. Blanton).
- Nevada, 5 ♂, 10 ♀, Wells, June 20 1927 (J. M. Aldrich) (U. S. N. M.).
- Nova Scotia, 1 ♂, Truro, July 4 1913 (R. Matheson).
- Rhode Island, 3 ♀, Newport, June 9, 1914.
- Virginia, 2 ♂, Va. Beach, June 22 1933 (U. S. N. M.).
- Washington, 1 ♂, Ringold, July 4 1919; 1 ♀, Lind, June 16 1919; 1 ♀, Lake Paha, July 20 1920 (R. C. Shannon).

Phyllogaster rufitibia (Stein)

Tetramerinx rufitibia Stein, Arch. f. Naturgesch., 1911 A (1) p. 144. . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9) p. 59.

Tetramerinx californiensis Malloch, Trans. Amer. Ent. Soc., 1918 No. 782 XLIV p. 274. . . . Malloch, Canad. Ent., 1921 LIII p. 11.

The species has the tibiæ reddish as in *littoralis* and *parvimaeculatus*, but from these species it may be distinguished by the presence of four pairs of postsutural dorsocentral bristles. The abdomen has paired markings, as in *robustus* and *cordyluroides*, but the tarsi do not possess the robust longish pulvilli that is characteristic of these two species.

California, 1 ♂, 1 ♀, San Francisco dunes, Nov. 11 1907 (J. C. Bradley) (Z. M. U. B.); 1 ♀, Ingleside, Aug. 26 1908 (J. C. Bradley).

Phyllogaster robustus Johnson

Phyllogaster robustus Johnson, Canad. Ent., 1917 XLIX p. 148. . . . Malloch, Canad. Ent., 1921 LIII p. 11. . . . Johnson, Occ. Pap. Boston Soc. Nat. Hist., No. VII 1925 p. 230. . . . Hockett, Mem. 101 N. Y. (Cornell) Agr. Exp. Station, 1928 (1926) p. 835.

Phyllogaster maximus Stein, Arch. f. Naturgesch., 1920 (1918)
A (9) p. 59.

The species may be readily distinguished from allied forms by the presence of a well developed bristle at middle of posteroventral surface of fore tibia, and near middle of anterodorsal surface of mid tibia. In addition, there are invariably three well developed apical bristles on dorsum of hind tibia. In the male the basal sclerite of hypopygium exhibits a peculiar puckering of the chitin, such as is also present in specimens of *cordyluroides* and *mallitosus*.

Florida, 1 ♀, Biscayne Bay (Slosson) (U. S. N. M.).

Massachusetts, 1 ♀, Chatham, June 30 1904 (paratype); 1 ♀, Woods Hole, Aug. 2 1900; 1 ♂, Aug. 9 1900; 2 ♂ Eastham, May 30 1922 (U. S. N. M.); 1 ♂, 1 ♀, Edgartown, June 27 1912; 1 ♂, 1 ♀, Gloucester, June 20 1924 (H. C. H.).

New York, 1 ♀, Cold Spring Harbor, Long Island, July (U. S. N. M.).

Rhode Island, 1 ♂, Buttonwoods, June 17 1921 (paratype) (U. S. N. M.).

Phyllogaster longispinus Malloch

Phyllogaster longispinus Malloch, Proc. Cal. Acad. Sci., 1923 ser. 4 XII (21) p. 426.

I have included this species in the present study despite the fact that so far it has only been recorded from Gonzales Bay in Lower California. From what we know of the wide distribution of many species belonging to this genus it does not seem improbable that this species may be found in Southern California at least.

The species most closely resembles *robustus*, from which it may be distinguished by the lack of a bristle at middle of posteroventral surface of fore tibia and of anterodorsal surface of mid tibia, and by the presence of only two apical bristles on dorsum of hind tibia instead of three, as is invariably present in *robustus*. Also in the male the copulatory appendages are compact and not conspicuous as in *robustus* and *cordyluroides*. The distal bristle of anterodorsal and posterodorsal series and apical mid dorsal bristle of hind tibia are each longer than the length of hind metatarsus.

I have had the privilege of examining the female paratype in the collection of the United States National Museum.

Phyllogaster mallitosus new species

Male and female: Similar to *cordyluroides*, dove-gray in color, with no abdominal or thoracic markings except trace of a dorsocentral streak on abdomen. Vestiture sparse. All femora broadly yellowish at apex, all tibiæ and tarsi yellowish, with trace of infuscation.

Male with prebasal pair of scutellar bristles shorter than caudal pair of dorsocentral bristles. Abdomen with bristles short and weakly developed, not as long as posterior notopleural bristle. Fore femur with posteroventral bristle fine and weakly developed except for one or two apical, weaker than the bristles of posterodorsal series: fore tibia with no mid-posteroventral bristle, with apical posterodorsal bristle shorter than diameter of tibia where situated: mid femur with posteroventral bristles setulose: mid-tibia with 2 short posterodorsal bristles: hind femur with 1 or 2 bristles on distal third of anteroventral surface, with 2 or 3 setulose bristles on proximal third: hind tibia with 1 anteroventral, 2 anterodorsal, 1 or 2 posterodorsal bristles, and with a well developed apical posteroventral bristle. Tarsi with claws and pulvilli inconspicuously developed. Length, 3.5-5 mm.

Female similar to male in chaetotaxy except that the bristles are stronger and slightly longer: ovipositor with a pair of stoutly developed recurved spines at apex of subanal plate. Length, 4-5.5 mm.

Type and allotype, Chesapeake Beach, Maryland, Aug. 19 1919 (J. M. Aldrich) (U. S. N. M.).

The species was included under the name *P. cordyluroides* in the United States National Museum collection, of which it appears as a pale unmarked form. There are however, in my opinion, certain structural differences present which have led me to believe that the specimens represent a distinct species. The prebasal pair of scutellar bristles is shorter than the caudal pair of dorsocentral bristles on the mesonotum, and the apical posterodorsal bristle on fore tibia and all pulvilli are short and weak in development. In the male the gonostyli (inferior forceps) lack setae on the outer surface, and in the female the pair of recurved spines on subanal plate of ovipositor is strongly developed. In *cordyluroides* the prebasal pair of scutellar bristles is as long as the caudal pair of dorsocentral bristles, and the apical posterodorsal bristle on fore tibia and all pulvilli are well developed. In the male the gonostyli are clothed with setae

on outer surface, and in the female the recurved spines on subanal plate of ovipositor are relatively small in development.

Florida, 1 ♂, 1 ♀, St. Augustine (U. S. N. M.).

Maryland, 4 ♂, 4 ♀, Chesapeake Beach, July 19 1919 (U. S. N. M.).

Virginia, 1 ♂, 1 ♀, Va. Beach, 1933 (U. S. N. M.).

Phyllogaster cordyluroides Stein

Phyllogaster cordyluroides Stein, Berl. Ent. Zeitschr., 1898 (1897) XLII (3-4) p. 256. . . . Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 559. . . . Johnson, Psyche, 1909 XVI (1) p. 5-12. . . . Smith, Ann. Rept. N. J. State Museum, 1909, 1910 p. 797. . . . Coquillett, Proc. U. S. Nat. Mus., 1910 XXXVII No. 1719 p. 590. . . . Johnson, Bull. Amer. Mus. Nat. Hist., 1913 XXXII (3) p. 78. . . . Malloch, Canad. Ent., 1917 XLIX p. 227. . . . Stein, Arch. f. Naturgesch., 1919 (1917) A (1) p. 141. . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9) p. 59. . . . Malloch, Canad. Ent., 1921 LIII p. 12. . . . Johnson, Occ. Pap. Boston Soc. Nat. Hist. No. VII 1925 p. 230. . . . Johnson, Insect Fauna, Biol. Surv., Mt. Desert Region, 1927 p. 209. . . . Hockett, Mem. 101 N. Y. (Cornell) Agr. Exp. Station, 1928 (1926) p. 835. . . . Ogilvie, Insects of Bermuda, 1928 p. 43.

There is only one species with which *cordyluroides* may be confused, namely *mallitosus*. I have seen pale specimens of *cordyluroides* from Florida and Texas, as noted by Malloch (10a), which do not display clearly the markings of the abdomen, but such specimens have the prebasal pair of scutellar bristles as long as the caudal pair of dorsocentral bristles, the apical posterodorsal bristle of fore tibia and all pulvilli well developed, and, in the female the recurved spines on subanal plate of ovipositor are proportionately small in size. Most of the specimens I have seen bear at least traces of tergal markings on abdomen. It is interesting to note that this is the only species belonging to the genus that has been recorded as occurring elsewhere than on the American continent, namely in Bermuda.

Florida, 2 ♀, St. Augustine (Coq.) (U. S. N. M.).

- Maine, 1 ♀, Narrows, Mt. Desert, July 27 1919.
 Maryland, 1 ♀, Chesapeake Beach, June 30 (U. S. N. M.).
 Massachusetts, 1 ♂, Woods Hole, July 2 1900.
 Missouri, 1 ♀, Pass Christian, June 7 1917.
 New Jersey, 1 ♂, 1 ♀, Sea Isle City, July 22 1894.
 New York, 1 ♂, Sea Cliff, Long Island, Aug.-Sept. 5 1910 (N. Banks).
 Texas, 5 ♂, 7 ♀, Galveston, June 10 1917 (J. M. Aldrich) (U. S. N. M.).

Phyllogaster parvimaculatus (Stein)

Tetramerinx parvimaculata Stein, Arch. f. Naturgesch., 1920 (1918) A (9) p. 60.

There is little that need be added to Stein's description of the species to ensure its recognition. I have indicated in the key that the species structurally approaches that of *littoralis*, differing essentially in having a second posterodorsal bristle on hind tibia. In addition the species possesses restricted markings on abdominal terga 3 and 4, which in *littoralis* are lacking.

Texas, 3 ♂, 1 ♀, Galveston, June 1900 (cotypes) (U. S. N. M. and Z. M. U. B.).

Phyllogaster littoralis Malloch

Phyllogaster littoralis Malloch, Canad. Ent., 1917 XLIX pp. 227, 228. . . . Malloch, Ent. News, 1918 XXIX p. 32. . . . Malloch, Canad. Ent., 1921 LIII p. 12. . . . Frison, Bull. Ill. Nat. Hist. Surv., 1927 XVI (3) p. 207. . . . Hockett, Mem. 101 N. Y. (Cornell) Agr. Exp. Station, 1928 (1926) p. 835.

The species may be readily recognized by its yellowish tibiæ, the presence of three pairs of postsutural dorsocentral bristles, and by the absence of a well developed apical posteroventral bristle on hind tibia. In addition the abdomen and thorax are uniformly pale gray, densely dusted, and have no marks; the hind tibia has only I posterodorsal bristle, situated proximad, and the tarsal claws are proportionately small in size. Most of the specimens examined possess one or more setulæ on the under surface of the proximal sector of vein *R*.₄₊₅.

Alberta, 1 ♀, Miberrie, Sept. 8 1924 (H. L. Seamans).
 Colorado, 1 ♀, Ft. Collins, Aug. 19 1906 (U. S. N. M.).

- Illinois, 2 ♂, 3 ♀, Waukegan, Aug. 24 1917.
 Indiana, 3 ♂, 5 ♀, Michigan Cy., Sept. 5 1927 (J. M. Aldrich);
 2 ♀, June 29 1915 (U. S. N. M.).
 New Jersey, 1 ♀, Sea Isle City, March 22 1894 (U. S. N. M.).
 New York, 3 ♂, 1 ♀, Oswego, July 2 1896; 1 ♀, Ontario Beach,
 N. Fairhaven, July 3 1922.
 Pennsylvania, 1 ♂, 9 ♀, Presque Isle, Aug. 5 1924 (H. Kahl).
 Quebec, 1 ♂, Kazubazua, Aug. 17 1927 (G. S. Walley).
 South Dakota, 2 ♂, 1 ♀, Mobridge, Aug. 13 1924: 1 ♀, Hot
 Springs, July 9 1924: 1 ♂, Springfield, June 25 1924.
 Utah, 1 ♀, Lewiston, July 2 1927 (G. F. Knowlton) (U. S. N. M.).
 Wyoming, 1 ♀, Old Faithful, Yellowstone Park, Aug. 12 1927
 (J. M. Aldrich) (U. S. N. M.).

Genus *Limnospila* Schnabl

- Limnospila* Schnabl, Wien. Ent. Zeitg., 1902 XXI p. 111. . . .
 Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p.
 562. . . . Williston, Manual N. A. Dipt., 1908 3rd ed. p. 336.
 . . . Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Akad.
 Naturforsch., 1911 XCV Nr. 2 pp. 141, 142. . . . Stein,
 Arch. f. Naturgesch., 1916 (1915) A (10) pp. 112, 220. . . .
 Ringdahl, Ent. Tidskr., 1918 XXXIX p. 160. . . . Stein,
 Arch. f. Naturgesch., 1919 (1917) A (1) p. 95. . . . Séguy,
 Faune de France, 1923 (6) p. 194. . . . Karl, Tierwelt
 Deutschlands, 1928 XIII (3) p. 207. . . . Hockett, Mem.
 101 N. Y. (Cornell) Agr. Exp. Station, 1928 (1926) p. 835.
 . . . Ringdahl, Ent. Tidskr., 1929 L p. 13. . . . Curran,
 Fam. Gen. N. A. Dipt., 1934 p. 396.
 Coenosia Stein, Katal. Paläark. Dipt., 1907 III p. 735. . . .
 Coquillett, Proc. U. S. Nat. Mus., 1910 XXXVII No. 1719
 p. 526.
 Genotype *Aricia albifrons* Zetterstedt.

The genus *Limnospila* was erected by Schnabl (29) in 1902 for the reception of *Aricia albifrons* Zetterstedt. Heretofore the species *albifrons* has been commonly referred to *Cœnosia* Meigen owing to the widely separated eyes in both sexes and the arrangement of the sternopleural bristles to form an equilateral triangle. Strobl (43) in 1893 included the species in his segregate *Pseudo-*

limnophora as *obscuripes* Rondani, a synonym of *albifrons*. Later in the same year Pokorny (23) arbitrarily changed the name of such a group to *Stroblia*, placing therein most of the species listed under *Pseudolimnophora*, including *albifrons*. Schnabl considered *albifrons* as generically distinct from *Musca triangula* Fallén, the type of *Stroblia* and *Pseudolimnophora*, on account of the triangular position of the sternopleural bristles, and hence he proceeded, as above mentioned, to erect the genus *Limnospila*. Since this time the group has remained monobasic. From all limnophorine genera *Limnospila* differs essentially in possessing only one pair of reclinate parafrontal bristles on vertex of head, instead of two such pairs. Despite the distinctive appearance of *albifrons* itself I have been unable to recognise any good tangible characters on which to base the genus. In both sexes the frontal vitta is divided by a densely dusted whitish ocellar triangle, which extends to base to antennæ. In the male the whole frons is more or less silvery pruinose. The inner pair of vertical bristles is widely separated, the distance being nearly equal to length of either bristle. The caudal pair of ocellar bristles is weakly developed, the bristles being no longer than the presutural acrostical bristles. The abdominal terga bear subtriangular marks.

Limnospila albifrons (Zetterstedt)

- Aricia albifrons* Zetterstedt, Dipt. Scand., 1849 VIII p. 3301.
Coenosia obscuripes Rondani, Della Soc. Ital. Scienz. Natur., 1866 IX p. 203. . . . Rondani, Dipt. Ital., Prodr., 1877 VI (5) p. 267. . . . Strobl, Verh. zool.-bot. Gesellsch. Wien, 1893 XLIII p. 273. . . . Pandellé, Rev. ent. France, 1899 XVIII p. 154.
Pseudolimnophora obscuripes Strobl, Verh. zool.-bot. Gesellsch. Wien, 1893 XLIII p. 273.
Stroblia albifrons Pokorny, Verh. zool.-bot. Gesellsch. Wien, 1893 XLIII pp. 541, 543.
Coenosia albifrons Stein, Berl. Ent. Zeitschr., 1898 (1897) XLII (3-4) p. 276. . . . Coquillett, Proc. Wash. Acad. Sci., 1900 p. 446. . . . Stein, Katal. Paläark. Dipt., 1907 III p. 736. . . . Stein, Wien. Ent. Zeitg., 1908 XXVII (1) p. 3.

Limnospila albifrons Schnabl, Wien. Ent. Zeitg., 1902 XXI p. 111. . . . Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 562. . . . Coquillett, Proc. U. S. Nat. Mus., 1910 XXXVII No. 1719 p. 561. . . . Schnabl and Dzedziicki, Abh. K. Leop.-Carol. Akad. Naturforsch., 1911 XCV Nr. 2 p. 142. . . . Stein, Arch. f. Naturgesch., 1914 (1913) A (8) p. 28. . . . Stein, Arch. f. Naturgesch., 1916 (1915) A (10) p. 112. . . . Ringdahl, Ent. Tidskr., 1918 XXXIX p. 160. . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9) p. 58. . . . Séguy, Faune de France, 1923 (6) p. 194. . . . Johnson, Occ. Pap. Boston Soc. Nat. Hist., No. VII 1925 p. 230. . . . Hallock, Circ. 103 N. J. Dept. Agr., 1926 p. 16. . . . Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, 1927 p. 208. . . . Karl, Tierwelt Deutschlands, 1928 XIII p. 207. . . . Hockett, Mem. 101 N. Y. (Cornell) Agr. Exp. Station, 1928 (1926) p. 835.

The species may be readily distinguished from allied forms by its notably broad frons and whitish pruinose frontal triangle, resembling in this respect specimens of *Pseudolimnophora nigripes* (Robineau-Desvoidy). From *Phyllogaster unicus* (Stein), to which it also bears a superficial resemblance on account of its small size, the species may be distinguished by the nondepressed character of the second antennal segment, by the restriction of the arisal thickening to extreme base, and by the relatively weaker development of the caudal pair of ocellar bristles.

Alaska, 9 ♂, 3 ♀, Anchorage, June 16 1921; 3 ♂, July 19 1921: 3 ♂, 2 ♀, Seward, July 24 1921: 1 ♂, Skagway, June 7 1921 (J. M. Aldrich): 2 ♀, Saldovia, July 21 1899 (T. Kincaid) (U. S. N. M.).

British Columbia, 1 ♀, Prince Rupert, Aug. 16 1919 (H. G. Dyar).

Maine, 1 ♂, Narrows, Mt. Desert, Aug. 13 1920 (U. S. N. M.).

Nevada, 1 ♀, Steamboat, May 13 1917 (H. G. Dyar) (U. S. N. M.).

Utah, 1 ♂, Salt Lake City, July 18-20 1917 (U. S. N. M.).

Genus *Pseudocœnosia* Stein

Cœnosia Stein, Wien. Ent. Zeitg., 1902 XXI (2-3) p. 35. . . . Stein, Katal. Paläark. Dipt., 1907 III p. 740.

Macrorchis Stein, Arch. f. Naturgesch., 1914 (1913) A (8) p. 9.
Pseudocænosiæ Stein, Arch. f. Naturgesch., 1916 (1915) A (10)
 pp. 113, 220. . . . Stein, Arch. f. Naturgesch., 1919 (1917)
 A (1) p. 95. . . . Stein, Arch. f. Naturgesch., 1920 (1918)
 A (9) p. 60. . . . Karl, Tierwelt Deutschlands, 1928 XIII
 pp. 204, 207. . . . Ringdahl, Ent. Tidskr., 1929 L p. 13.
 . . . Collin, Ent. Month. Mag., 1930 LXVI pp. 228, 229.

Genotype *Aricia longicauda* Zetterstedt.

The genus was described by Stein (39) in 1916 for the reception of the European species *Aricia longicauda* Zetterstedt and *Pseudocænosiæ abnormis* Stein. The former species had heretofore been placed in *Cænosiæ*, and had been cited more recently by Stein (38) as being linked to *Macrorchis* Rondani. In 1928 Karl (7) designated *longicauda* as the genotype.

The genus is evidently represented by species that are rather aberrant in appearance, a deduction that is further supported by the evidence provided by the finding of two additional forms from North America. In many respects the genus may be considered as related to *Macrorchis* on the one hand, and to *Limnospila* on the other. With the exception of the European species *abnormis* the males possess many notably long fine bristles clothing the coxæ, on the ventral region of sternopleura, and at base of posteroventral surface of mid and hind femora, the tip of the bristles in many cases curling. In addition the fore tibia possesses a short mid anterodorsal bristle and the mid femur a preapical bristle on anterior surface.

Diagnostic characters: Frontal vitta narrowed, tapering cephalad, at narrowest width scarcely, if any, greater than maximum breadth of both parafrontals when viewed from above: caudal pair of ocellar bristles weakly developed, not longer than presutural acrostical bristles, directed forward: third arisal segment restricted at base to narrower proportions than second arisal segment: hind tibia with a stout bristle at middle of anterodorsal surface, as in *Cænosiæ*: abdomen in male subconical, hypopygium robust, fifth sternum with broad pendant processes.

KEY TO SPECIES

1. Hind tibia with a stoutly developed apical posterodorsal bristle, which is longer than diameter of tibia where situated; hind femur with no

duplicating bristle situated ventrad of distal bristle of anterodorsal series: male with fifth sternum deeply incised to beyond middle of plate; ventral border of basal sclerite of hypopygium polished.

nigriventris new sp.

- Hind tibia with apical posterodorsal bristle fine and setulose, shorter than diameter of tibia where situated; hind femur with a duplicating bristle situated ventrad of distal bristle of anterodorsal series; males with fifth sternum incised to about middle of plate; basal sclerite of hypopygium not polished ventrad 2
- 2. Hind tibia with a strongly developed apical posteroventral bristle, with 1 mid anteroventral bristle; hind tarsi not longer than hind tibiæ; male with processes of fifth sternum truncated *brevicauda* new sp.
- Hind tibia with apical posteroventral bristle weakly developed, setulose; with 2 or 3 mid anteroventral bristles; hind tarsi longer than hind tibiæ; male with processes rounded along caudal margin.

longicauda Zetterstedt

***Pseudocoenosia nigriventris* new species**

Male blackish; head with dense velvety pruinescence on parafrontals and parafacials; frontal vitta with whitish dust when viewed from in front; antennæ and palpi black; proboscis polished. Thorax subshining; lightly pruinose, with trace of darker streaks along planes of dorsocentral bristles. Abdomen highly shining, with trace of pruinescence, deep black, with little trace of dorsal markings: ventral region of basal sclerite of hypopygium and of ninth tergum (anal sclerite) and the greater part of the processes of fifth abdominal sternum polished. Legs black, highly shining; pulvilli tinged. Wings with trace of yellowish tinge along anterior border and at base. Lower calyptæ faintly yellowish, upper calyptæ whitish. Halteres yellowish.

Frons at narrowest slightly wider than length of third antennal segment; frontal vitta wider than the maximum breadth of either parafrontal; parafacials at base of antennæ fully as wide as, and cheeks as high as, width of third antennal segment, the former slightly narrowed ventrad. Arista pubescent, longest hairs fully equal to twice diameter of second arista segment. Eyes broadly ovoid. Mesonotum with three pairs of postsutural dorsocentral bristles; caudal pair of acrostical bristles not longer than the presutural pairs. Abdomen stoutly developed, deep and truncated, greatest depth about equal to three-quarters its length; hypopygium large, ventral region of basal sclerite of hypopygium expanded slightly into two horizontal lobes; fifth sternum deeply incised, the processes large and pendant, the apical region with numerous well developed bristles directed caudad, otherwise clothed with fine longish bristles and setulæ.

Fore tibia with a mid anterodorsal and a stronger mid posterior bristle; mid femur with a preapical bristle on anterior surface, and with 3 or 4 long fine bristles on proximal half of posteroventral surface: mid tibia with 1 mid anterodorsal, 1 mid posterodorsal and a shorter bristle proximad: hind femur with 7 anteroventral bristles, of which the prebasal bristles are longest and

strongest and those at base fine and slender, with four long bristles on proximal half of posteroventral surface, which become finer developed basad; hind tibia with 1 mid anteroventral bristle, with 1 strong bristle at middle of anterodorsal surface and with a shorter bristle proximad, with 1 short posterodorsal bristle on proximal half, with apical posterodorsal bristle well developed, and with apical posteroventral bristle weakly developed, setulose. Pulvilli elongate, claws slender, longish. Wings with *r-m* cross vein situated opposite the point of union of R_{1+2} with costa; section of M_{1+2} between *r-m* and *m-cu* cross veins about equal in length to the section immediately proximad. Length, 5.25 mm.

Female similar to male, eyes more widely separated, ocellar triangle extended cephalad to three-quarters length of frontal vitta. Parafrontals narrower. Legs with similar chaetotaxy except that the proximal bristles on posteroventral surface of mid and hind femora are shorter. Length, 5.5 mm.

Type and allotype, Rattlesnake Cr., Tulare Co., Cal., 9000 ft., Aug. 2 1915. (A. N. S. P.)

The species may be distinguished from *longicauda* and *brevicauda* by its more intense black coloration, by the strongly developed apical posterodorsal bristle on hind tibia, and by the presence of only one preapical bristle on anterodorsal surface of hind femur. Owing to the condition of the specimens I am unable to state definitely whether the species has one or two pairs of normal reclinate parafrontal bristles. In all three specimens there are indications that this species may possess a second pair of reclinate bristles. The problem is further complicated by the fact that there is a tendency in the genus for variations to occur affecting the development and number of bristles forming the parafrontal series.

***Pseudocoenosia brevipennis* new species**

Male similar in color and marking to *longicauda*. Parafrontals and parafacials velvety pruinose, face and cheeks duller; proboscis polished; antennæ and palpi blackish; frontal vitta, viewed from in front, with light brownish dust. Thorax grayish black, more densely dusted than abdomen; mesonotum unmarked. Abdomen blackish, subshining, with trace of dorso-central vitta on terga 1+2, 3, and 4; fifth tergum and basal sclerite of hypopygium largely fuscous; fifth sternum polished along inner and caudal borders of processes. Legs blackish, femora concolorous with abdomen; pulvilli tinged. Wings tinged with yellow anteriorly and basad; calyptræ paler than base of wing, whitish, lower scale tinged; halteres reddish yellow, with trace of darker tinge.

Head with frons narrower than in *longicauda*, at narrowest scarcely equal

to length of third antennal segment; frontal vitta narrower than either parafacial. Parafacials in profile, at base of antennae, slightly wider than breadth of third antennal segment. Cheeks about as high as width of third antennal segment. Eyes oval in outline; the ventral occipital region of head restricted, not prominently produced. Aristal hairs not longer than diameter of second aristal segment. Mesonotum with three pairs of postsutural dorso-central bristles. Abdominal vestiture and structure similar to that of *longicauda*, the most noteworthy difference being the more quadrate outline of the processes, the mesocaudal angle being rectangular and thus the inner and caudal margins straight.

Fore coxæ armed with an inner and outer series of strong bristles on anterior surface; fore tibia with a short mid anterodorsal and a stronger bristle on posterior surface at about the same level; mid femur with 3 or 4 longish bristles on proximal half of posteroventral surface, with a preapical bristle on anterior surface: mid tibia with 1 mid anterodorsal and 1 weaker mid posterodorsal bristle: hind femur with 4 or 5 well spaced bristles on anteroventral surface, those proximad finer and equally long or longer, with 4 or 5 fine long bristles on proximal half of posteroventral surface, with 2 adjacent preapical bristles on anterodorsal surface; hind tibia with 2 anteroventral, with 1 strong mid anterodorsal bristle, and a shorter weaker bristle proximad, with a short mid posterodorsal bristle, with apical posterodorsal bristle setulose, and with apical posteroventral bristle robust. Tarsal claws and pulvilli well developed. Wings with *r-m* cross vein opposite a point on costa that is distad of its union with *R*₁. Section of *M*₁₊₂ between *r-m* and *m-cu* cross veins slightly shorter than the immediate section proximad. Length, 5 mm.

Type, ♂ Jasper, Alta., July 25 1926 (J. McDunnough) (C. N. C.).

The species, as indicated by the male sex, closely resembles *longicauda*, from which it may be separated by the presence of a stoutly developed apical bristle on posteroventral surface of hind tibia; by the truncated outline of the processes of fifth sternum, and by their polished appearance; by the narrower frons; and by the presence of an inner series of strong bristles on anterior surface of fore coxæ. In *longicauda* the apical posteroventral bristle on hind tibia is setulose in development, the processes of fifth sternum are rounded in outline along the caudal border, and the fore coxæ are largely clothed with fine setulæ on anterior surface.

Pseudocœnosia longicauda (Zetterstedt)

?*Aricia longisquama* Zetterstedt, Dipt. Scand., 1845 IV p. 1622.
Aricia longicauda Zetterstedt, Dipt. Scand., 1860 XIV p. 6230.

- Cænosiæ octosignata* Strobl not Rondani, Verh. zool.-bot. Gesellsch., Wien, 1893 XLIII p. 267.
- Cænosiæ longicauda* Stein, Wien. Ent. Zeitg., 1902 XXI p. 35.
 . . . Stein, Wien. Ent. Zeitg., 1908 XXVII (1) p. 12. . . .
 Stein, Katal. Paläark. Dipt., 1907 III p. 740.
- Cænosiæ rondanii* Strobl, Wiss. Mitth. Bosnien, 1900 VII p. 615.
- Macrorchis longicauda* Stein, Arch. f. Naturgesch., 1914 (1913) A (8) p. 9.
- Pseudocænosiæ longicauda* Stein, Arch. f. Naturgesch., 1916 (1915) A (10) p. 113. . . . Stein, Arch. f. Naturgesch., 1919 (1917) A (1) p. 95. . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9) p. 60. . . . Karl, Tierwelt Deutschlands, 1928 XIII (3) pp. 204, 208. . . . Ringdahl, Ent. Tidskr., 1929 L p. 13. . . . Collin, Ent. Month. Mag., 1930 LXVI pp. 228-229. . . . Ringdahl, Arkiv f. Zool., K. Svensk. Vetenskapsakad., 1930 XXIA (20) p. 2.

The species most closely resembles *brevicauda* in coloration, markings, and structure. Their distinguishing characters have been cited in the paragraphs devoted to a discussion of that species. In the series of specimens collected in Colorado I note that one female has apparently two pairs of reclinate parafrontal bristles on vertex of head. The same is true in the specimens of *nigriventris*. It is not always possible to discern the true differences between the two types of parafrontal bristles in the genus, especially if there be a second bristle directed caudad. There is ample evidence at hand to indicate that in this genus there is a tendency for variations to occur affecting the number and development of the bristles in the parafrontal series.

Alaska, ♀ Savonoski, Naknek Lake, June 19- (J. S. Hine).

Alberta, 1 ♂, 1 ♀, Banff, June 9 1922; 1 ♀, May 5 1922; 1 ♀, June 1 1922; 1 ♂, June 29 1922; 1 ♀, July 4 1922; 1 ♀, Sept. 12, 1922 (C. B. D. Garrett) (C. N. C.).

Colorado, 6 ♂, 3 ♀, Tennessee Pass, 10240 ft., July 9-; 1 ♂, July 10- (J. M. Aldrich). (U. S. N. M.).

South Dakota, 1 ♀, Sylvan Lake, July 19 1924: 1 ♀, Custer, July 17 1924. (S. D. Agr. Col.).

Genus *Macrororchis* Rondani

- Macrororchis* Rondani, Dipt. Ital., Prodr., 1877 VI (5) p. 280. . . .
 Stein, Katal. Paläark. Dipt., 1907 III p. 732. . . . Stein.
 Arch. f. Naturgesch., 1916 (1915) A (10) pp. 12, 203, 220.
 . . . Stein, Arch. f. Naturgesch., 1919 (1917) A (1) pp. 95,
 156. . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9)
 p. 93. . . . Malloch, Ent. News, 1921 XXXII p. 106. . . .
 Séguy, Faune de France, 1923 (6) pp. 64, 180. . . . Karl,
 Tierwelt Deutschlands, 1928 XIII (3) pp. 204, 206. . . .
 Curran, Fam. Gen. N. A. Dipt., 1934 p. 396.

Genotype *Musca meditata* Fallén.

The genus was erected in 1877 by Rondani (27) with *Musca meditata* Fallén as type. This species has, so far as I know, remained the only valid representative of the genus in Europe. There are three North American forms recorded, namely *Anthomyia alone* Walker, *Cænosiä ausoba* Walker, and *Cænosiä majuscula* Coquillett. A fourth species is herein added to the list, having been collected by Dr. J. M. Aldrich in Alaska.

The genus may be distinguished from *Pseudocænosiä*, which it most closely resembles, by having the caudal pair of ocellar bristles directed outwards and not forward, by having the lower stigmal bristle directed downward, and not upward, and by the opaque, grayish pruinose prosternum, which in *Pseudocænosiä* is shining and polished.

On account of the presence of a so-called second pair of presutural dorsocentral bristles in occasional specimens of *Cænosiä*, difficulties will undoubtedly arise in attempts to dissociate such specimens from this genus, the more so since such diagnostic characters as the proportionate development of the lower calyptral scale and the relative extent of the anal vein tend also to be variable factors. In these respects I have had difficulty in placing the new species herein recorded, but have concluded that it may be considered as being more closely associated with this genus than, for instance, with the *Hoplogaster* or *Limosiä segregates* of *Cænosiä*, where it would otherwise be included.

Diagnostic characters: Lower calyptra strongly protruded beyond margin of upper; mesonotum with two pairs of well developed presutural dorsocentral bristles; caudal pair of ocellar

bristles directed outwards; lower stigmal bristle on thoracic pleura directed downward; arista slender, slightly thickened at basal region.

KEY TO SPECIES

1. Mid and hind femora entirely yellow; abdomen with no paired markings; ninth tergum (anal sclerite) of male with numerous strong bristles2
- Mid and hind femora at least fuscous or blackish in part; abdomen with paired marks; male with at most weak bristles on ninth tergum3
2. Fore femur entirely yellow; second antennal segment normal in appearance, not noticeably appressed on proximal half to slender proportions, the segment shorter than half distance between oral vibrissæ; hind femur with 1 preapical anterodorsal bristle (the distal bristle of anterodorsal series); hind tibia with one longish apical anteroventral bristle.
ausoba Walker
- Fore femur more or less blackened along the dorsal surface; second antennal segment markedly appressed on proximal half to slender proportions, the segment as long as half distance between oral vibrissæ; hind femur with 2 adjacent preapical bristles on anterodorsal surface; hind tibia with 2 subequal robust apical anteroventral bristles.....*alone* Walker
3. Mid and hind femora with no preapical posteroventral bristle, situated at a level with the preapical posterodorsal bristle; distal section of $M_3 + Cu_1$, to wing margin, shorter than *m-cu* cross vein; all femora entirely blackened on proximal three-fourths*majuscula* Coquillett
- Mid and hind femora with a preapical posteroventral bristle, situated at a point opposite the preapical posterodorsal bristle; distal section of $M_3 + Cu_1$, to wing margin, as long as *m-cu* cross vein; mid and hind femora with at least a trace of yellowish proximad*comita* new sp.

Macrorchis ausoba (Walker)

- Anthomyia ausoba* Walker, List Dipt. Brit. Mus., 1849 IV p. 938.
. . . Walker, Canad. Ent., 1871 III p. 144. . . Osten Sacken, Misc. Coll. Smithsn. Inst., 1878 (270) p. 169.
- Cænosiæ aurifrons* Stein, Berl. Ent. Zeitschr., 1898 (1897) XLII (3-4) p. 260. . . Smith, Ann. Rept. State Board Agric. 1899 Suppl., 1900 p. 682. . . Stein, Zeitschr. f. Hymen. Dipt., 1901 (4) p. 187.
- Cænosiæ ausoba* Stein, Ann. Mus. Nat. Hungar., 1904 II p. 488.
. . . Aldrich, Misc. Coll. Smithsn. Inst., 1905 XLVI No. 1444 p. 560. . . Smith, Ann. Rept. N. J. State Museum 1909, 1910 p. 793. . . Britton, Bull. 31 Conn. Geol. Nat. Hist. Surv., 1920 p. 199. . . Cole and Lovett, Proc. Col. Acad. Sci., 1921 XI No. 15 p. 314.

Macrorchis ausoba Stein, Arch. f. Naturgesch., 1919 (1917) A (1) 156. . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9) p. 93. . . . Johnson, Proc. Boston Soc. Nat. Hist., 1925 XXXVIII (2) p. 94. . . . Johnson, Occ. Pap. Boston Soc. Nat. Hist., No. VII 1925 p. 236. . . . Johnson, Insect Fauna, Biol. Surv. Mt. Desert Region, 1927 p. 211. . . . Hockett, Mem. 101 N. Y. (Cornell) Agr. Exp. Station, 1928 (1926) p. 835.

The species has undoubtedly a wide distribution in North America, occurring in marshy and swampy areas. It agrees with *alone* and *majuscula* in having the distal section of vein $M_{.3} + Cu_{.1}$ scarcely as long as $m-cu$ cross vein, and in the possession of a rather noticeable pruinescent spot at apex of second antennal segment. However *ausoba* differs from both species in having the fore femur entirely yellow, and in possessing only one long apical anteroventral bristle on hind tibia.

British Columbia, 1 ♂, Vernon, June 4 1924: 1 ♀, Agassiz, July 15 1926 (R. Glendenning).

Illinois, 1 ♂, Algonquin, Aug. 26 1894.

Indiana, 2 ♂, Chesterton, June 2 1916: 1 ♀, Vincennes, May 9—: 1 ♀, Michigan City, Aug. 18 1914.

Maine, 1 ♂, Bar Harbor, Aug. 5 1918 (C. W. Johnson): 2 ♂, Sebago Lake, Sept. 9 1914.

Manitoba, 2 ♀, Aweme, July 10 1926 (R. D. Bird).

Massachusetts, 3 ♂, Beverly, June 3 1876; 1 ♂, July 4 1869; 1 ♂, 1 ♀, June 2 1876; 1 ♀, June 15 1876; 1 ♀, June 19 1867 (U. S. N. M.).

Minnesota, 1 ♀, New Ulm, May 20 1916.

Newfoundland, 1 ♂, Stephenville; 1 ♀, Bay St. George, July; 1 ♂, Port aux Choix.

New Hampshire, 1 ♂, White Mts., (Morrison) (U. S. N. M.): 1 ♀, Mt. Washington, (Slosson): 1 ♀, Franconia, (Coquillett).

New York, 2 ♂, Riverhead, Long Island, Aug. 10 1927; 1 ♂, Sept. 26 1929; 1 ♀, Oct. 2 1927; 1 ♀, June 27 1926: 1 ♂, Ithaca, June 10 1920: 1 ♂, Saranac Lake, Aug. 26 1916: 1 ♀, Schenectady, June 30 1929: 2 ♀, Wells, Aug. 25 1923.

Ohio, 2 ♀, Cuyhga Fls., Aug. 10 1904.

Ontario, 1 ♂, Toronto, June 13 1896; 1 ♂, July 7 1896 (U. S. N. M.). 3 ♀, Whitby, July 6 1926 (C. H. Curran): 1 ♀, Lyn, July 7 1926 (G. S. Walley).

Quebec, 1 ♀, Fairy Lake, June 1 1927 (W. J. Brown): 1 ♀, Aylmer, Sept. 28 1924 (C. H. Curran).

South Dakota, 1 ♂, 2 ♀, Brookings, June 18 1891 (U. S. N. M.): 1 ♂, Erwin, June 1908.

Wisconsin, 1 ♂, Brule River, Doug. Co., Aug. 23 1912 (Witmer Stone) (A. N. S. P.).

Macrorchis alone (Walker)

Anthomyia alone Walker, List Dipt. Brit. Mus., 1849 IV p. 941.

. . . Osten Sacken, Misc. Coll. Smithsn. Inst., 1878 (270) p. 169.

Macrorchis alone Hockett, Canad. Ent., 1934 LXVI p. 133.

Male allotype, similar in coloration and marking to *ausoba*, except that the mesonotum has a narrow brownish dorsocentral vitta and the fore femur has a blackish mark along posterodorsal surface. Structurally more robust than *ausoba*: frons wider than one third maximum width of head, when viewed from in front; width of parafacials at base of antennæ nearly equal to one half maximum breadth of eye; height of cheek about one third that of eye; length of second antennal segment about half that of third antennal segment, noticeably attenuated proximad. Arisal hairs slightly longer than diameter at base of arista. Hypopygium similar to that of *ausoba*, processes of fifth sternum more densely clothed with longer bristles and setulæ along ventral (inner) border.

Legs stronger bristled, and tarsi stouter developed than in *ausoba*. Fore tibia with a well developed apical posteroventral bristle; hind femur with an additional preapical bristle near anterodorsal surface; hind tibia with 3 well developed apical bristles on dorsum, and with 2 longish bristles at apex of anteroventral surface; otherwise the bristling of legs similar to that of *ausoba*. Length, 12 mm.

Allotype, Natashquan, P. Q., Aug. 1 1929 (W. J. Brown) (C. N. C.).

This species has been cited by Stein (34) (41) as probably a

synonym of *ausoba*, and as such has been commonly considered. I am of the opinion that the species is distinct from *ausoba*, and can be distinguished by the blackened dorsal patch of infuscation on fore femur; by the additional long duplicating bristle at apex of anteroventral surface of hind tibia, and on the preapical region of the anterodorsal surface of hind femur; and by the more noticeable attenuation of the second antennal segment, proximad.

Alaska, 1 ♂, Fairbanks, July 1 1921; 1 ♂, July 3 1921; 1 ♂, July 4 1921: 1 ♀, Anchorage, July 19 1921; 1 ♂, July 20 1921 (J. M. Aldrich) (U. S. N. M.).

Alberta, 1 ♂, Lethbridge, June 23 1924; 2 ♀, July 2 1924 (H. E. Gray).

Manitoba, 1 ♂, Teulon, July 8 1922 (A. J. Hunter).

Quebec, 1 ♂, 2 ♀, Natashquan, Aug. 1 1929 (W. J. Brown) (C. N. C.).

Macrorchis majuscula (Coquillett)

Cænoscia majuscula Coquillett, Invert. Pacif., 1904 1 p. 34.

Macrorchis majuscula Malloch, Trans. Amer. Ent. Soc., 1918 XLIV No. 782 p. 286. . . . Stein, Arch. f. Naturgesch., 1919 (1917) A (1) p. 156. . . . Stein, Arch. f. Naturgesch., 1920 (1918) A (9) p. 93.

The species differs notably from others in having all femora entirely blackened on proximal three-fourths, and in the possession of two closely adjacent bristles at middle of hind tibia, as in *Cænoscia tigrina* (Fabr.). As in *alone*, the apical posteroventral bristle on fore tibia, in male, is well developed, and there is, in both sexes, a second long anteroventral bristle at apex of hind tibia. From *comita* the species may be further distinguished by the lack of a preapical posteroventral bristle on mid and hind femora, and by the restricted distal section to $M_{.3} + Cu_{.1}$, which is shorter than $m-cu$ cross vein.

California, 1 ♂, Santa Clara Co., (Baker). (U. S. N. M.): 1 ♂, Pacific Grove, May 7 1906: 1 ♀, Redwood City, April 19 1906: 2 ♀, Salt Marshes, Palo Alto, April 20 1906 (Z. M. U. B.).

Macrorchis comita new species

Male blackish; frontal vitta blackish with pale brownish pruinescence; parafrontals grayish, as occiput, with little or no pruinescence; parafacials

and cheeks more highly whitish pruinose, face gray; antennæ blackish, second segment with whitish dust on inner surface, and with pruinose spot at apex; palpi blackish, shining; proboscis polished. Thorax grayish black, subshining, concolorous with occipital region of head, with macrochaetæ set in fuscous spots, with brownish infuscation between the planes of dorso-central bristles, from which 3 denser marked vittæ appear, arising along the planes of acrostical and dorso-central bristles; scutellum infuscated at basal angles. Abdomen concolorous with thorax, with four pairs of widely spaced subtriangular or roundish fuscous marks; processes of fifth sternum shining along inner border. All coxæ blackish, as thorax; trochanters yellowish. Fore femur largely blackish, mid and hind femora more or less blackish infuscated throughout distal half, yellowish proximad; all tibiæ yellowish, tarsi blackish, pulvilli brownish tinged. Wings faintly tinged with yellow along cephalic border and proximad; calyptræ whitish, margins yellowish tinged. Halteres yellow.

Head with frons nearly one-third maximum width of head, ocellar triangle extended cephalad to near center of frontal vitta; width of parafacials at base of antennæ about equal to one-third maximum width of eye, narrowed ventrad to about equal to width of third antennal segment; height of cheek nearly one-third that of eye, ventral margin of eye not reaching a level with oral vibrissæ; second antennal segment about half as long as third segment, slightly but perceptibly attenuated proximad; hairs on arista not longer than basal diameter of arista; ventral half of occipital region of head prominently produced; palpi slender, clavate. Abdomen broadly conical, compact, deeper caudad, with numerous well developed discal bristles, in appearance resembling that of *Hoplogaster morrisoni* Malloch. Hypopygium not large, basal sclerite well developed, with numerous bristles of about equal size to those along caudal margin of tergum 5; ninth tergum (anal sclerite) inconspicuous, not globose, with a few fine setulose bristles and hairs; processes of fifth sternum broad, thickened and shining along inner border and apical region, on which arise numerous erect slender bristles and hairs, the former becoming stronger apicad. Sterna broader than long.

Fore tibia with a slender mid posterior bristle; mid femur with a series of short bristles on proximal half of anteroventral surface, with a series of 5 to 7 widely spaced longer bristles on posteroventral surface, from base to near apex, with a preapical bristle on anterior surface; mid tibia with a mid anterior and posterior bristle at about the same level, the former weaker than the latter; hind femur with 5 or 6 bristles on anteroventral and on posteroventral surfaces, from base to near apex, the strongest and longest bristles being situated toward the proximal region of femur; hind tibia with a mid anteroventral, a strong mid anterodorsal and a short mid posterodorsal bristle. Tarsi slender, hind tarsus about as long as hind tibia, tarsal claws well developed, pulvilli robust, elongate. Length, 5.5 mm.

Female similar to male, the wings more uniformly tinged; parafacials and cheeks slightly narrower; third antennal segment tapered distad; second antennal segment normal in appearance, scarcely equal in length to half that of

third antennal segment. Discal bristles of abdomen short and weakly developed, scarcely longer than marginal bristles of their respective terga; abdominal sterna 2 to 5 longer than wide; fifth tergum with a sparse series of weak marginal bristles. Fore tibia with a weak mid anterodorsal and a mid posterior bristle; mid and hind femora and hind tibia with bristling similar to male; mid tibia with a mid anterior and posterior bristle, of about equal size; pulvilli and claws well developed. Wings with veins R_{4+5} and M_{1+2} divergent at wing margin. Length, 5.75 mm.

Type, ♂ Healy, Alaska, June 23 1921; Allotype, ♀ same locality, June 26 1921 (J. M. Aldrich) (U. S. N. M.).

The species does not readily conform to the general characteristics of the genus, as I accept them, the markings, chaetotaxy, and structure of the parts having more in common with *Cænosia* than *Macrorchis*. However the above specimens possess two well developed pairs of presutural dorsocentral bristles, and hence with the present keys, such specimens may no doubt be more readily traced to this genus for purposes of identification than to elsewhere. The species bears a resemblance to *Hoplogaster morrisoni* Malloch, but that species has only one pair of presutural dorsocentral bristles and the lower calyptral scale is not larger than the upper.

CORRIGENDA

Tetramerinx femorata Malloch (9) is more closely allied to the species comprising the genus *Limnophora sens.-str.* Malloch (13) has erected the genus *Bucephalomyia* for its reception.

Tetramerinx brevicornis Malloch (10) and *Tetramerinx uralica* Stein (42) belong more correctly to the group *Spilogona* Robineau-Desvoidy.

Phyllogaster nudiseta (Stein) in a list of the insects of New York (8) refers undoubtedly to the species *Cænosia nudiseta* Stein.

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University (C. U.), Zoological Museum of the University of Berlin (Z. M. U. B.).

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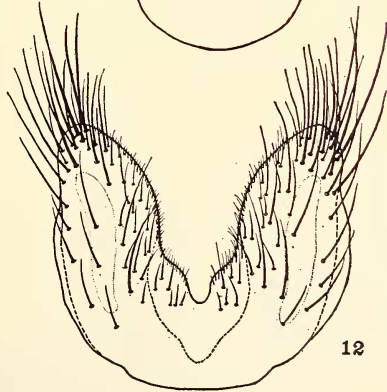
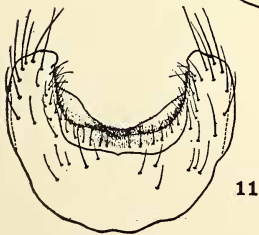
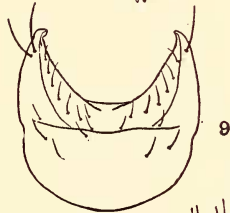
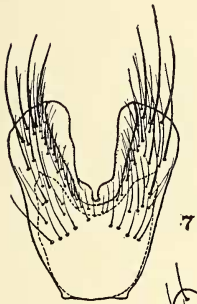
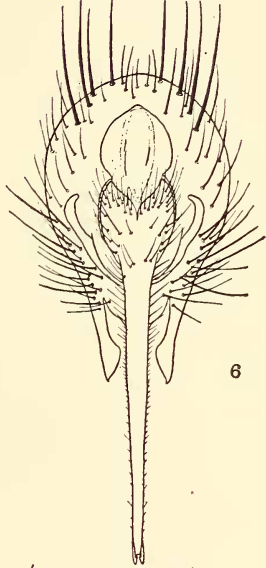
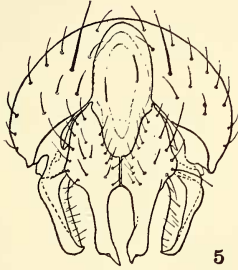
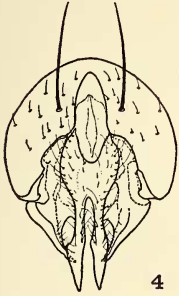
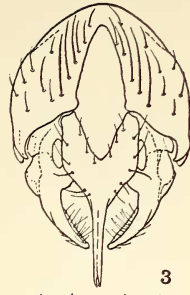
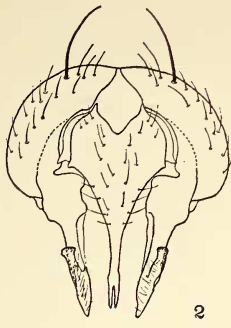
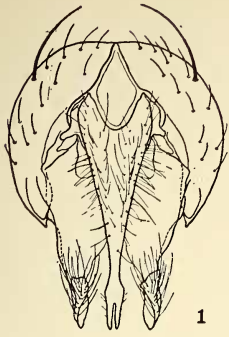
PLATE IV

Dorsal or caudal aspect of male copulatory appendages.

- Figure 1. *Phyllogaster cordyluroides* Stein
- Figure 2. *Phyllogaster mallitosus* new species
- Figure 3. *Phyllogaster unicus* (Stein)
- Figure 4. *Phyllogaster littoralis* Malloch
- Figure 5. *Limnospila albifrons* (Zetterstedt)
- Figure 6. *Macrochis ausoba* (Walker)

Ventral aspect of fifth abdominal sternum in male.

- Figure 7. *Phyllogaster cordyluroides* Stein
- Figure 8. *Phyllogaster mallitosus* new species
- Figure 9. *Phyllogaster unicus* (Stein)
- Figure 10. *Phyllogaster littoralis* Malloch
- Figure 11. *Limnospila albifrons* (Zetterstedt)
- Figure 12. *Macrochis ausoba* (Walker)



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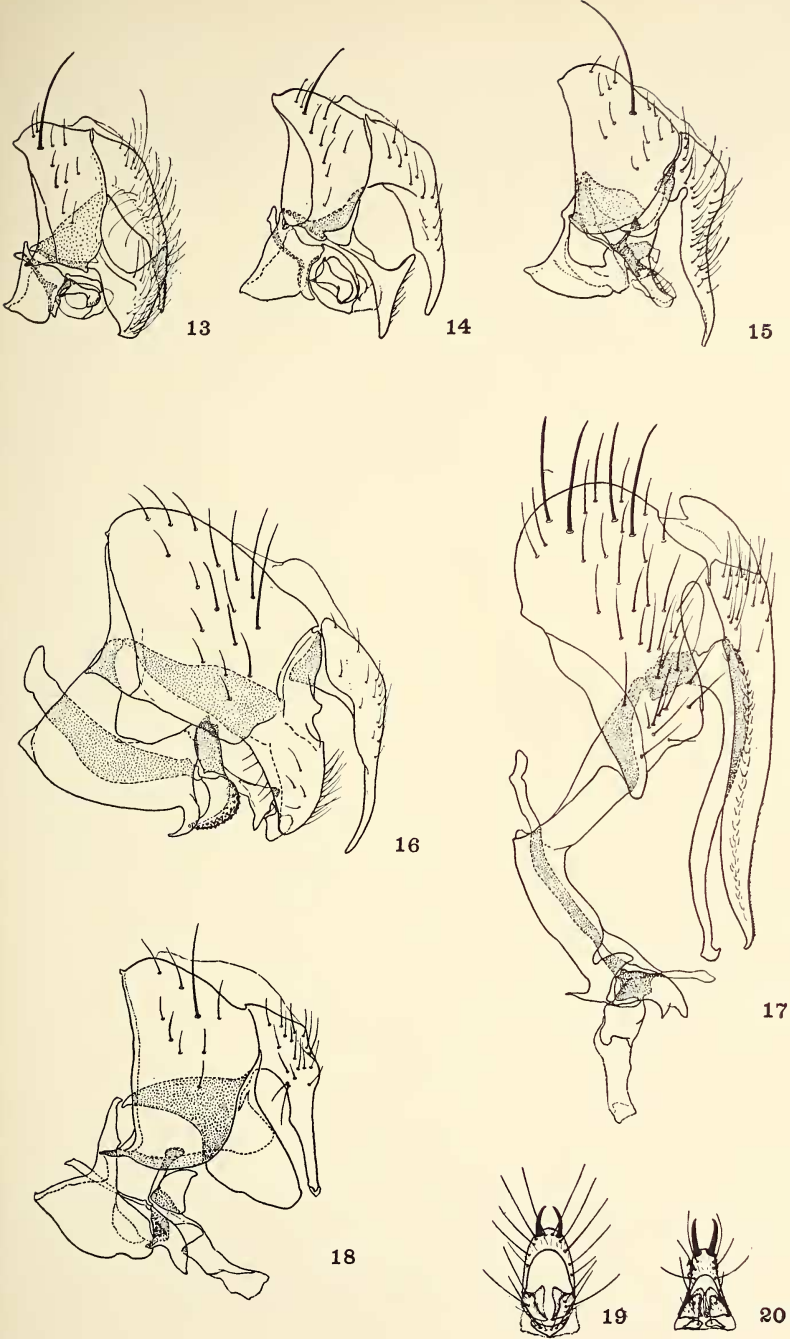
PLATE V

Lateral aspect of male copulatory appendages.

- Figure 13. *Phyllogaster cordyluroides* Stein
- Figure 14. *Phyllogaster mallitosus* new species
- Figure 15. *Phyllogaster littoralis* Malloch
- Figure 16. *Phyllogaster unicus* (Stein)
- Figure 17. *Macrorchis ausoba* (Walker)
- Figure 18. *Limnospila albifrons* (Zetterstedt)

Dorsal aspect of anal sclerites in female.

- Figure 19. *Phyllogaster cordyluroides* Stein
- Figure 20. *Phyllogaster mallitosus* new species



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